

Interface Professional Development Event February 22-27, 2007 -- Tan-Tar-A -- Osage Beach, Missouri

Call for Presentation Proposal Interface Professional Development Event 2007 “Standards, Curriculum, Assessment, Instruction: Forces Aligned to Increase Student Understanding”



Interface is a statewide science and mathematics professional development event presented by the Missouri Department of Elementary and Secondary Education. Interface is for all educators interested in science and mathematics. This professional development event allows practitioners to network and share best practices in their field.

While a presentation may include multiple presenters, registration, two (2) nights lodging, and mileage expenses will only be provided for up to two presenters who work for bona fide non-profit organizations.

Presenters are expected to provide a well-planned, interactive, and meaningful experience for practitioners. Handouts are required and may be subject to preview. Presenters are responsible for all materials/printing costs associated with their presentation.

Pages **five through nine** of your proposal must be complete and provide specific information so that reviewers can complete the review process. If you need assistance while completing the form, please contact Linda Lacy or Teri Longley using the contact information listed below. The Interface Steering Committee will consider and score each proposal. **Selected presenters will be notified by October 13, 2006.**

Interface Professional Development Event information
is provided by the
Missouri Department of Elementary and Secondary Education
Division of School Improvement
Linda Lacy, Science Consultant, Co-Chair
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Proposals must be postmarked no later than **June 16, 2006** and sent to:

**MU Conference Office
Attention: 2007 Interface Proposal Submission
344 Hearn Center
Columbia, MO 65211**

Selling of materials and/or the advertising of services during any presentation
is prohibited unless approved.

CONFERENCE STRANDS

(adapted from conference strand descriptions, www.nsta.org and www.nctm.org)

ALIGNED INSTRUCTION: Standards, Curriculum, Teaching Strategies, and On-going Assessment

Ideally, mathematics and science education should enable students to reason competently, think constructively, and understand key concepts in science and mathematics. This strand emphasizes the various needs of teachers and the variety of issues they must address in providing quality math and science curriculum. Today more than ever educators want to know what and how to teach to assure that all students learn math and science and appreciate its significance in American society. Theories in educational disciplines—curriculum, instruction, and assessment, for example—help to shape practice. Theories in fields related to education—human growth and development, for example—may help educators know what and how to teach children of various ages. Other disciplines may contribute to an understanding of how to teach math or science to second-language learners or to children of poverty, and how to structure effective professional development for teachers at various stages in their careers. Of particular interest are proposals that consider students’ naive concepts (misconceptions), cognitive development, inquiry, lesson construction, and both formative and summative assessment.

In this era of accountability, it is important to understand how formative assessment helps students perform on summative assessments. The teaching-learning cycle should be based on a constant assessment of student progress, not just on the chapter test or semester final. This strand also focuses on the power of formative assessment as a tool to help teachers make more informed decisions about instructional practice, facilitating the purposely selection of those learning activities and instructional strategies shown to have a positive effect on student achievement.

Goals: To provide sessions, workshops and seminars that:

- Use current research on effective instructional practices yielded from classroom-based findings
- Examine current research on how students learn and achieve
- Explicitly make connections between pedagogy, assessment, and student achievement
- Broaden, deepen, and enrich teachers’ content knowledge, focusing on the “big ideas” in math and/or science
- Identify naive concepts and the cognitive development of mathematics and science concepts
- Use summative and formative assessment data to guide and inform teachers’ instructional practices
- Use summative and formative assessment strategies to measure state math and/or science frameworks and classroom instruction
- Provide examples of classroom-based assessments and rubrics along with examples of student work for analysis
- Address how instruction is monitored, feedback is provided to students, and instruction adjusted based on student work
- Demonstrate connections between and among science, language arts, math, technology, and other disciplines
- Utilize models of differentiated instruction, designed to address the needs of underrepresented populations, including English Language Learners and students with special needs, through the implementation of effective strategies in the math and/or science curriculum

INQUIRY: Inquiry in the Mathematics and Science Curriculum

National Standards address inquiry both as a content standard and a teaching standard; yet there seem to be a myriad of conceptions about what classroom inquiry really is and models of classroom inquiry. This strand seeks to bring clarity to our conceptualization of what is being called “inquiry.”

Goals: To provide sessions, workshops and seminars that:

- Elucidate the fundamental abilities and understandings of classroom inquiry
- Explain and discuss the various “levels” of inquiry
- Model authentic mathematical and scientific inquiry as a teaching/learning strategy
- Develop teacher abilities needed to effectively design and implement inquiry lessons
- Demonstrate the effectiveness of inquiry as a teaching strategy for student understanding
- Provide examples of inquiry-based instruction and student work
- Address the needs of underrepresented populations, including English Language Learners and students with special needs, through the implementation of effective strategies in the math and/or science curriculum

“Standards, Curriculum, Assessment, Instruction: Forces Aligned to Increase Student Understanding”

The 2007 theme highlights the relationships among standards, written curriculum, on-going assessment, purposeful instructional strategies, and student understanding. The conference is designed to increase teacher knowledge of content and pedagogy through sessions focusing on exemplary curriculum and instruction models and strategies designed to construct and monitor student understanding. Research into “How Students Learn Mathematics and Science” stresses the importance of (1) engaging prior understandings; (2) the essential role of factual knowledge and conceptual frameworks in the development of understanding; and (3) the importance of self-monitoring (metacognition). These findings relate specifically to content and process standards and should be addressed in order to increase teacher quality and student achievement.

HIGH-QUALITY PROFESSIONAL DEVELOPMENT

The primary mission of the Interface Professional Development Event is to promote best teaching practices in mathematics and science education. The original focus of the Interface conference was to provide professional development that would increase the integration of math and science. The current focus on student literacy skills reemphasizes the need for integration of reading and writing instruction in math and science classrooms. There is also a strong research base that supports the integration of technology and environmental education as a means to increased student achievement and motivation in all classes. **In order to support research-based curriculum and instruction, Interface sessions should focus on content, pedagogy, and appropriate integration of the following subjects: Mathematics, Science, Technology, and/or Environmental Education.**

With the implementation of the No Child Left Behind Law in 2002, rules for acceptable professional development opportunities have been defined. Effective professional development

- is high quality, sustained, intensive, and classroom-focused in order to have a positive and lasting impact on classroom instruction and the teacher's performance in the classroom;
- is on-going (not 1-day or short-term workshops or conferences);
- improves and increases teachers' knowledge of academic subjects;
- gives teachers the knowledge and skills to provide students with the opportunity to meet challenging State academic content standards and student academic achievement standards;
- advances teacher understanding of effective instructional strategies;
- is aligned with and directly related to State academic content and student academic achievement standards and assessments;
- provides training for teachers and principals in the use of technology and technology applications that can be effectively used in the classroom to improve teaching and learning; and
- improves classroom management skills.

In order to increase practitioner's content knowledge and pedagogical skills, and to cause increases in students' math and science achievement, sessions are coded so that practitioners can schedule a series of sessions designed to provide intensive professional development within a focus strand.

Every session is required to focus on the objectives of at least one professional development strand. The 2007 Focus Strands are defined as:

- **ALIGNED INSTRUCTION: Standards, Curriculum, Teaching Strategies, and On-going Assessment**
- **INQUIRY: Inquiry in the Mathematics and Science Curriculum**
- **LITERACY: Integrating Science, Mathematics, and Literacy**
- **TECHNOLOGY: Using Technology to Advance Science and Mathematics Learning**

LITERACY: Integrating Science, Mathematics, and Literacy

The integration of math, science and literacy is not just for elementary schools! All teachers, K–12, need to use every opportunity available to emphasize these inter-relationships to all their students. Math, science and literacy are linked in a large variety of ways, but especially through the use of similar critical thinking/comprehension skills (e.g., cause and effect, summation, prediction, etc.). Students who do math and science build and strengthen their reading, writing, speaking, and listening skills as they develop deeper understanding of math and science. Literacy skills facilitate increased understanding and application of math and science content and skills. Teachers must explicitly teach literacy skills within the context of math and science instruction (and teach math and science content and skills within the context of literacy instruction) in order to make these vital linkages come alive for students.

Goals: To provide sessions, workshops and seminars that:

- Provide scientifically based research on the effective integration of literacy in the math-science curriculum
- Model effective strategies for making math, science and literacy connections at the elementary, middle, and high school levels
- Address expository reading in the content areas at the elementary, middle, and high school levels
- Encourage and nurture student writing in the content areas at the elementary, middle, and high school levels
- Highlight curricula that emphasize math/science/literacy connections
- Incorporate the use of technology with inquiry lessons
- Are designed for novice through experienced practitioners
- Address the needs of underrepresented populations, including English Language Learners and students with special needs, through the implementation of effective strategies in the math and/or science curriculum

TECHNOLOGY: Using Technology to Advance Learning in Math and Science

Society has undergone a shift from an industrial economy to a knowledge-based economy. This change necessitates a transformation in teaching and learning and requires the use of technology as “smart tools” to facilitate this change. This strand focuses on best practices that incorporate use of current and emerging technologies in the delivery and assessment of mathematics and/or science instruction to respond effectively to these new demands.

Goals: To provide sessions, workshops and seminars that focus on:

- Introducing real-world, cutting-edge examples of using technology for math and science inquiry that result in and facilitate increased classroom inquiry
- Promoting more effective teaching and learning in science through the use of handheld and wireless educational technologies, including tool-based software, Internet resources, and computer hardware and peripheral devices such as graphing calculators, digital cameras, Personal Digital Assistants (PDA's) and probeware
- Encouraging the use of models and data visualization in the mathematical and scientific enterprises
- Using technology to collect, manage, and analyze math/scientific data
- Developing innovative math/science courses and curricula that include integrated technology
- Using technology that enhances literacy skills to access, investigate, and apply mathematical and scientific information
- Addressing the needs of underrepresented populations, including English Language Learners, students with special needs, and/or nontraditional careers for males and females, through the incorporation of technology in the math/science curriculum
- Use technologies to support access and communication between learners while establishing virtual communities of learners
- Strategies for increasing the quality of technology-enhanced teaching of math and/or science for K-12 students and/or in-service and pre-service teachers